Atmospheric Science 101 Syllabus
Introduction to Weather and Climate I

Instructor: Don Wheeler, M.Ed., Assistant Professor of Science/Math
Office: Coenen 135; Phone: 318-342-3722; Email: deltascience@earthlink.net

I. Course Description

Atmospheric Science (ATM 101) 3 credit hours. This course will present an integrated approach to basic meteorology. Basic science skills, such as the scientific method, will be highlighted through meteorology. Meteorology concepts such as structure of the atmosphere, solar radiation, temperature, and atmospheric stability will be covered. Prerequisites: none.

II. Course Objectives and Outcomes

This course will enable the student to:

A. Identify and explain major concepts in meteorology and climatology and their various subtopics.
B. Discuss orally and explain in writing how weather affects our everyday lives.
C. Explain the importance of weather on society and the business world.
D. Utilize process skills and problem-solving skills to solve laboratory applications in meteorology.
E. Explain and give examples of the relationship of science, technology, and society.

III. Course Topics

The major topics to be considered are:

A. Meteorology
    1. Composition of the Atmosphere
    2. Solar Radiation and Terrestrial Radiation
    3. Temperature
    4. Moisture and Atmospheric Stability
    5. Condensation and Precipitation
    6. Air Pressure and Winds
    7. Circulation of the Atmosphere

IV. Instructional Methods and Activities

This course will be made as interactive as possible. Daily weather briefings will begin each class period. An emphasis will be placed on making observations. Monitoring certain meteorological factors on a daily basis will create a rudimentary database from which the students can utilize in graphing and making predictions.

V. Evaluation and Grade Assignment

A. Methods

1. Written examinations (100 points each)
2. Quizzes (announced and unannounced)
3. Class work points: problem solving and laboratory activities, individual and/or group projects, and class participation (up to 150 points).
4. Library assignment/report (one-half to one test grade)

B. Written examinations and quizzes

1. Will cover specified chapters and activities
2. Will consist of all or some of the following types of test methods: matching, multiple choice, short answer, labeling, and discussion
3. One hour will be designated for taking 100 point tests, 30 minutes for quizzes

C. Class work points

1. Class work points will be awarded throughout the semester. Some may be random and without notice. Attendance and participation will be rewarded; therefore, notice may not be given for the days points can be earned.
2. Class work points are earned simply by participating in the process of inquiry during laboratory and classroom activities. There are no wrong answers during this process, therefore, enthusiasm and effort earns you points!

D. Report for an additional grade (library assignment)

A library assignment worth 1/2 test grade will be given. The student will choose a topic about physical science emphasizing meteorology. Details will be given later in the semester.

E. Grading Scale

90-100 A; 80-89 B; 70-79 C; 60-69 D; below 60 F

VI. Course Schedule (See attached)

Course schedule is to be used as a guide and is subject to change.

VII. Textbook

Ahrens, Donald C., *Meteorology Today*, 9th edition. Thompson-Brooks/Cole Publishers

VIII. Provision Statement for the Physically Challenged

If a student is visually, physically, or otherwise challenged, the instructor is to be informed within the first week of class so that accommodations can be made. Situations that arise at anytime will be accommodated as they may occur.

IX. Provision Statement for the Learning Disabled

If a student is learning disabled, the instructor is to be informed within the first week of class so that accommodations can be made. Situations that arise at anytime will be accommodated as they may occur.

X. Discrimination Statement

This class is an open forum for your ideas and those of your classmates. However, language or behavior, which in any way degrades or discriminates against any group, including, but not limited to age, race religion, gender, and/or sexual orientation will not be tolerated in the classroom. The result of this type of behavior could be expulsion from the class and perhaps from the institution.

XI. Academic Misbehavior

Identified instances of academic misconduct, which include any form of cheating or plagiarism will not be tolerated. The result of these actions could include expulsion from the class or from the college.

Class Policies

*Class policies may be amended at anytime by the instructor.

1. Attendance policies correspond to those of Louisiana Delta Community College. It should be noted that class attendance is very important in order to facilitate learning.

2. Assignments are due on or before the given date or will result in a grade of zero.

3. Examinations are to be taken on the dates assigned. Should you miss the exam, **YOU MUST REQUEST THE MAKEUP AT THE <u>BEGINNING</u> OF CLASS ON THE DAY YOU RETURN!** It is your responsibility to keep up with your work and be prepared for class. DO NOT MISS AN EXAM! This instructor has a no tolerance policy.
   No one will be allowed to take an exam once class has started. If the door is closed, do not bother knocking or coming in for any reason. If you wish to appeal, see me during my office hours, not during the exam time. Prepare for delays in getting to campus. Being late for an exam is irresponsible and is quite rude and disruptive for students engaged in the test taking process and will not be tolerated. Classes begin on time, so get there early!
   Cheating on an exam will result in a grade of 0% and may result in expulsion from the course.

4. Fire alarm and evacuation procedures – see posted evacuation routes on walls of each individual class.

5. **Cellular telephones, pagers, and any new electronic device including those yet to be invented are to be turned off or placed in silent mode. To avoid an issue with them going off in class, simply do not bring them. Should they go off, get up, gather your belongings and leave. No excuses are necessary. Repeated offenses will result in permanent dismissal from the course. In lieu of recent and unfortunate school shootings, vibrate mode may be experimented. It will be up to the instructor to make the final determination.**

6. No tobacco products of any kind will be allowed in the classroom. This includes chewing, dipping, snuff, cigarettes, etc.

7. No firearms or weapons of any kind are allowed in the classroom. Do not go postal on us. We didn't do it! Let us know and we'll try to bring justice to the person who did do it. Violation of this policy will result in expulsion from this class and perhaps from the college.

8. No alcoholic beverages or illegal drugs are allowed in the classroom. If you are under the influence when you come to class and your behavior is disruptive in any way (including sleeping), you will be asked to leave the class, perhaps for the remainder of the semester. Expulsion from the college is also possible.

9. **All classes will begin at the time posted on your schedule. This means that roll will be called at that time. After roll has been called, you will be marked absent. You may enter, except test day, but you will still be marked absent. It is advisable you arrive at least 5 minutes prior to the scheduled starting time. Time will be based entirely on the United States Cesium Clock (known as "Atomic Time") located in Ft. Collins, Colorado. This time can be found via the internet, an atomic watch, or an atomic clock. One is found in Professor Wheeler's office.**

10. Grades are a personal issue. If you have a question about your grade, please see the instructor before or after class or during office hours or by appointment. Grades will be posted on blackboard within one week following the exam. Grades will NOT be discussed via phone or email. Grades will NOT be discussed with parents unless procedure has been followed in the records office proving you are listed as that parent's dependent. Ask Dean Stickney for more information on the privacy issues should you have a concern.

11. Disrespect toward the instructor or other class members will result in immediate dismissal from the class

12. Sleeping in class is not allowed.

13. Children are not permitted. Baby sitting services are not provided.

14. In extreme cases should a student be asked to leave and refuses, campus security will immediately be contacted for your safe removal.

If you feel you cannot adhere to the aforementioned rules, then you should immediately drop the course.

Atmospheric Science 101 General Course Outline

***This schedule is for general guidance only. Prepare for a flexible schedule.**
Modifications WILL BE MADE during the course.

I. The Earth and Its Atmosphere
- A. Composition of the Atmosphere
- B. Early Atmosphere
- C. Vertical Structure
- D. Air Pressure and Density
- E. Weather and Climate – An Introduction

II. Energy: Warming the Earth and the Atmosphere
- A. Energy, Temperature and Heat
  1. Temperature Scales
  2. Specific Heat
  3. Latent Heat
- B. Heat Transfer – Conduction, Convection, Radiation
- C. Heat Budget

III. Seasonal and Daily Temperatures
- A. Seasons
- B. Temperature, Measurements, and Patterns

IV. Atmospheric Moisture
- A. Water in the Atmosphere
  1. Phases of Water
- B. Humidity – Absolute, Specific, Relative
- C. Mixing Ratio
- D. Vapor Pressure
- E. Dew Point

V. Condensation: Dew, Fog, and Clouds
- A. Formation of Dew and Frost
- B. Condensation Nuclei
- C. Fog
  1. Radiation
  2. Advection
  3. Upslope
  4. Evaporation/Mixing
- D. Clouds
  A. Classification
  B. Cloud Identification

VI. Stability and Cloud Development
- A. Atmospheric Stability
- B. Determining Stability

VII. Precipitation
- A. Precipitation Processes
- B. Precipitation Types
- C. Measuring Precipitation

VIII. Air Pressure and Winds
- A. Atmospheric Pressure
- B. Surface and Upper-Level Charts
- C. Newton's Laws of Motion
- D. Forces that Influence Winds

1. Pressure Gradient Force
2. Coriolis Force
3. Geostrophic Winds
4. Gradient Winds

E. Vertical Air Motion

IX. Small-Scale and Local Systems

A. Local Wind Systems

X. Global Systems

A. General Circulation of the Atmosphere